

Demystifying Paper for Artists

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Introduction

Paper is amazing. There's a huge variety of different kinds of paper, all of which will react with different mediums in different ways.

The problem is when it comes to paper recommendations from other artists. Namely, as all humans are, we tend to be extremely myopic to our own individual approaches, and thus will recommend papers that fit our own approaches more than what would fit for others.

"Use only Arches," the watercolor teacher says, ignoring how expensive that paper is, and how much overkill it is for most students (or pro artists, for that matter). And if you ask said teacher *why*, they'll tell you either that the paper is the *best* because it *costs so much*, or that the paper is just the best because *reasons*.

The first book I read about watercolor, *The Complete Watercolorist's Essential Notebook*, by Gordon MacKenzie, was the first time I'd heard from any watercolor master the idea that Arches is not the *only* paper to use for watercolors: that what watercolor paper is best for any project needs to come down to (a) what do you actually need, and (b) how much does the paper cost?

As we do not live in a non-capitalist world, art supply cost is a really important question, especially for those of us who don't even have shallow pockets. My general experience is that any art teacher who ignores or downplays the question of cost, is not an art teacher who has ever had to deal with a month-to-month budget.

And that kind of exclusion of poor people from being artists is just infuriating to me on so many levels.

So I'm going to aim for discussing characteristics about paper so that people can make their own decisions about paper. I have some recommendations, but dear gods, do not take my word for it.

Paper Characteristics

Weight (lb vs gsm, and more)

Okay, tell me if you've heard this one before: "The only good watercolor paper must start at 140lb and up!"

First of all, the only good watercolor paper is that which reacts well to watercolors, which does not entirely depend on the weight. For instance, "90lb" 100% cotton rag internally sized watercolor paper will curb stomp 140lb cardstock any day. More weight is good, but it's not the be-all and end-all.

Second, "lb" is an unreliable paper weight because it is measured by number of sheets and not by size + number of sheets. "gsm", or Grams per Square Meter, *does* take into account the size of a sheet as well as the number of sheets. It's not uncommon for someone to advertise a 140lb paper that is much thinner than other papers of similar materials that are also advertised as 140lb.

This is why there's no universal gsm to lb converter, and any paper maker who tells you there is such is lying and only providing their own numbers.

Fortunately most reputable makers of paper will provide gsm alongside whatever they choose lb to represent. It would be a lot more correct to say "good watercolor paper must start at 300gsm and up", although not entirely correct (see the previous first point).

And once you have the gsm, you can make much more refined determinations of exactly what weight is good enough for your work. 140lbs usually, but not always, translates to 300gsm; that's a good baseline. From there you can look at a 270gsm paper and think, "hmm, almost as thick as 300gsm, but not much lower than 300gsm, so possibly still a candidate for the amount of wetness I want to use in my art process."

Also there is a different type of weight used for papers that are mounted on boards, called ply. I don't know as much about this as I'd like, except that every "ply" in a weight is a paper. So a 3-ply paper of this kind has 3 sheets of some kind of paper applied and melded together.

Cotton versus cellulose

Okay, many people will tell you that you have to get paper that is 100% cotton rag or else that paper is not archival and will not stand up to watercolors. We'll get to what is and what isn't "archival" in the next section. Now, it is true that the cheapest and worst papers are all cellulose, but that does **not** mean that all cellulose papers are cheap and bad.

For cellulose paper, its quality depends on how much alpha cellulose is in that paper. Alpha cellulose is the most stable component of wood and paper pulp. In fact, if you have a high enough alpha cellulose content and certain other paper characteristics (acid-free, lignin-free, we'll get to both of these in the archival discussion later) you can create paper that can last 1000 years.

One of the main signs that alpha cellulose is a super important part of how good a cellulose paper is, is that most manufacturers will refuse to disclose how much alpha cellulose is in their paper. Up to and including not even saying if some very vague "most" of the pulp used was alpha cellulose. Isn't that fun?

"See all the ways that art supply manufacturers will lie to you!" was not the post I wanted to write, but here we are.

Now, 100% cotton paper will stand up to more scrubbing and more wet-into-wet soakings (aka "abuse") than any cellulose paper; that part is true. But if you neither scrub nor pour cups of water over your paper as part of your process, paying for all this extra is not the most cost-effective move.

Archival

There are people who will proclaim that archival has no meaning and thus you shouldn't care about what paper is archival and what isn't. These people haven't done their research and so are not technically lying. And given how much art supply companies lie, you can't blame these people for this belief at all.

The thing is, standards do exist, like ANSI NISO Standard Z39.48-1984 (a US standard). International standards exist as well: "permanent" paper is ISO-9706, and "archival" paper is ISO-11108.

Cellulose papers can reach ISO-9706 standards with care in the manufacturing process, but truly archival (also called "museum-grade") papers are cotton rag to begin with, although a careless process will result in non-archival cotton rag.

(Some folks complain that ISO has lost all meaning because ISO technical standards are bought by big corporations, but the thing is, ISO for materials was established way before ISO for tech went downhill. Also tech has a lot deeper pockets than paper.)

Of course, art paper companies may claim their paper to be archival, but they might define archival in their very own ways. This isn't too terrible yet, because most don't try to make that claim on paper that can't at least meet ISO-9706 if someone were to call them out on it.

So what to do? The only answer is to consider what actually are archival qualities, and get paper that meets at least some of these qualities. A list of the ones I look at follows:

acid-free.

This means the paper wasn't made with acidic processes, and doesn't have acid in its make-up; e.g. the paper making process was alkaline (basic) in nature. Most papers are actually acid-free today due to changes in general manufacturing of paper, which is why this is a very common and very likely true claim across all sorts of papers. Acid destroys pigments and binders (e.g. paint, pencil, etc) if they're left with said pigments and binders for a long time, and since the marks you make on paper should generally stay there forever, the presence of acid is a big factor in artwork deterioration.

Please note, though, that there isn't a standard for the term "acid-free" unless the paper notes an ISO or ANSI or Museum of Congress standards compliance. Without any in-writing reassurances somewhere of such a standard being met by the paper, assume that this is the minimum meaning of acid-free: an alkaline manufacturing process, the end. Don't assume anything about cotton/cellulose/buffers/etc unless the company can give this to you in writing.

ph-neutral.

That means this paper is neither alkaline (aka basic) or acidic. This isn't a guarantee that the manufacturing process was acid-free; maybe the paper had an acidic manufacturing process but has had buffers added to bring the pH to neutral. I actually don't consider this to be good or bad, it might as well not be there as a word.

buffered.

This means the paper had alkaline reserve materials added to its make-up to counteract acid absorbed from the environment over time, or... due to lignins left in the paper. This is good, but not universal. What are lignins? Let's talk about them next.

lignin-free.

Lignins are chemical compounds that form the basis of those tough cell walls in plants (e.g., the cellulose). The problem is that lignins, due to how they are treated during manufacturing, become denatured and will release acid into the paper over time. Thus

paper that was acid-free fresh off the press may actually still deteriorate and become acidic due to lignins left inside the paper. Thus a paper that plans to be around for more than 20 years will also be lignin-free.

sulfur-free.

Sulphur causes tarnishing in paper over time. Pretty obvious why it shouldn't be in paper that needs to last.

Grain (cold-press, hot-press, NOT, rough, vellum, plate, etc)

The grain of a paper is how rough it is. There's absolutely zero standards as to what amount of grain counts as what. One manufacturer's cold-press (slightly textured) is another manufacturer's hot-press (more smooth), or yet another manufacturer's rough (very rough texture). What's the use of grain? Grain creates pockets for pigment to settle in, and the more grain a paper has, the less quick the spread of a watery medium (like watercolor) over it (although we're going to get to sizing soon, which has more of an effect on this). The more grain a paper has, the more layers of dry media you can add, so you can get better color blending and layered effects for colored pencils, for instance.

Then again, the more grain a paper has, the less easy it is to create an area of perfectly non-speckled color with dry media. The more grain a paper has, the more difficult it is to create fine detail with watercolors.

And of course, it's not just "how much grain" is on the surface, but also the size of those pockets, the distribution of those pockets, etc.

Here's some general ideas of what the different grain types should sort-of be:

cold-press

Has noticeable texture, but you will not notice huge divots if you move a light around the paper to see where the little bump shadows fall. Tiny bump shadows ok, somewhat bigger bump shadows means we're heading away from the loose definition of cold-press.

hot-press

Has very little texture, however, it will still have some texture. On a manufacturer's line, hot-press is guaranteed to be less textured than their cold-press, so there's a relative judgement you can make here.

NOT

As far as I can tell usually a synonym for cold-press, but please don't ask me what the heck it means if a manufacturer has both a cold-press paper and a NOT paper in the same general product line.

rough

A very rough texture. Big bump shadows. You definitely know it when you see it, although the border between cold-press and rough isn't very well defined.

vellum

Has a fuzzy feeling on top, because while the paper has a ton of pockets, those pockets are very close together. So you have deeper pockets for pigment layering, but they're very close so it's easier to not have speckles in areas of color. Many mixed media papers have a vellum surface for this reason. This vellum surface may be shallower or deeper depending on the paper: look at Strathmore 400 series mixed media versus Strathmore 500 series mixed media to get an idea of the spread between shallow and deep.

plate

A perfectly flat surface, or as flat as a porous surface like paper can get. It's great for inks, not so great for much else, but invaluable as it is the easiest paper to scan for production purposes since there are no bumps that affect the scanning process.

medium-grain

Basically "it's a little rougher than our cold-press, slightly", which I added because this is a term I'm familiar with from Stillman & Birn.

Sizing

Sizing is something coated on a paper (thus, external sizing), or added to the paper pulp (thus, internal sizing), that slows the absorption of water into the paper. This is the main characteristic that makes a paper stand up to wet media without as much degradation or tearing. If you've ever tried to paint with watercolors on printer paper, which is unsized, you can see the paper curdle as the water soaks into the fibers so fast and so completely that they deform and wrinkle. Watercolor papers and mixed media papers should have at least external or internal sizing to avoid this deformation as water is added to them. If you run across a paper that is "double-sized", that just means there is both external and internal sizing. Note to vegan artists: many sizing solutions contain gelatin, which is made from animal bones. I don't mind, but you might mind, so do your research re: the sizing used in your watercolor paper.

You can actually still use watercolors on non-sized paper, but you need to keep the amount of water you use very low and extremely controlled.

Notes for your own research

Just because I've written something here does not mean you should take my word for it. I recommend doing your own research, and I've given you a large plethora of search terms to use (believe me, most of my research on paper was *just* trying to get the right words to search on to get actual sourced information).

By the way: it's totally okay to scour a paper manufacturer's website and send questions to them. Sometimes they will give you little sample packs in exchange for your engagement, especially if you want to try out some specific papers for yourself, which is nice.

Sources

"The Nature of Lignin", by Ellen McCrady. [\[Link\]](#)

"What is the Difference Between Acid-Free and Archival?", Strathmore blog. (Note: paper manufacturer) [\[Link\]](#)

"Acid-free paper", Wikipedia (please check the sources cited as always for Wikipedia pages). [\[Link\]](#)

"Archival, Conservation, and Acid-Free Paper", Jackson's Art Blog. (Note: they sell art supplies.) [\[Link\]](#)

